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ABSTRACT

This study examined the intellectual development of black college students and investigated the relationship among students' intellectual development, their academic and social integration, and the noncognitive factors specified by Tracey and Sedlacek (1984). Subjects were 344 black undergraduate students at a large midwestern state university who provided background information and completed the Institutional Integration Scale (IIS), the Noncognitive Questionnaire (NCQ), and an Environmental Referent. A subsample of 146 students was also interviewed using the Reflective Judgment Interview (RJI). The major findings from the examination of class and gender differences on the IIS were the class differences found on the Peer Group Interactions scale and on the Social Integration scale, with seniors scoring somewhat higher than freshmen. Because of low internal consistency reliabilities on the NCQ, analyses could only be run on three of the eight scales. A class main effect was found only for the Knowledge Obtained in a Field scale. A gender main effect was obtained on the Successful Leadership Experience scale, with females scoring higher. Prior studies examining class differences have found that RJT scores increased with educational level; this pattern was repeated with this sample. These differences were not attributable to the academic or social integration nor to Tracey and Sedlacek's noncognitive factors. (NB)

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"Factors Influencing the Intellectual Development and Academic Achievement of Black College Students"

Final Report Submitted to the

Counseling and Human Development Foundation

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Bowling Green, Ohio

October, 1989

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Theoretical Framework

While student development theories have gained wide recognition for their potential to explain and promote the development of young adults and adults in post-secondary educational settings (Miller, Winston & Mendenhall, 1983; Rodgers, 1980), relatively little research has been conducted on the development of minority students in these settings. Because of this, the wisdom and utility of using the same theories to describe and explain the development of minority students has yet to be determined.

Currently, little information exists on two major questions that would assist theorists and practitioners to understand more fully the development of minority college students. First, do minority students follow a path consisting of similar developmental steps as do majority students? If so, then existing theories and models have a higher probability of accurately describing their development. If not, alternative models are needed. Second, even if existing models are accurate, little is known about the developmental characteristics of minority students in terms of these theoretical concepts.

In the domain of intellectual development in particular, a number of theories currently exist that attempt to describe the predictable changes in reasoning and thinking that occur in the post-adolescent years (Arlin, 1984; Basseches, 1984; Fischer, 1980; Fischer, Hand, & Russell, 1984; Kitchener & King, 1981; Perry, 1981). Yet few, if any, of these models were developed, normed, or validated using samples that included minority student representation, and none has an established research base documenting patterns of scores for minority samples. As such, models such as these remain open to the charge that they

may not adequately or accurately describe the development of minority students, and that they may be culturally- or racially-biased.

While little research has been done on minority student development, a sizeable and growing body of research has been focused on minority student attrition (e.g., Astin, 1975, 1978, 1982), which is higher than for majority students, especially among minorities enrolled in predominantly White institutions (Fleming, 1984, Sedlacek & Webster, 1978). Much of the attrition research on minority students has focused on those background factors (e.g., socio-economic status, gender, high school preparation) that influence academic achievement and persistence rates (Donovan, 1984; Gosman, Dandridge, Nettles, & Thoeny, 1983; Sedlacek & Webster, 1978).

Recently, however, researchers have turned their attention to characteristics of the campus *environment* that influence the academic achievement of minority students (Allen, 1986; Fleming, 1984; Pascarella, 1985). These studies suggest that specific environmental features (e.g., institutional commitment, campus climate) appear to have a direct influence on the adjustment and achievement levels of minority students.

Two concepts have been particularly useful in understanding this interaction. The first is the concept of academic and social integration into the college community (Tinto, 1975), or the number of successful and rewarding interactions a student has on campus. This concept plays a central role in Tinto's predictive model of student persistence, a model for which many studies have offered general support. (Terenzini & Pascarella, 1980).

The second concept that has been shown to be useful in understanding minority students' acclimation to the university environment is Tracey & Sedlacek's (1984) specification of several "noncognitive" variables that affect student academic success. These include such factors as self-confidence, positive self-concept, the ability to set long-term goals, the presence of a network of people who are supportive of one's academic

goals, and prior leadership experience. Whether such factors affect students' intellectual development as well as their persistence to graduation remains to be seen.

Purpose

The first purpose of the current study was to examine the intellectual development of minority (specifically, Black) college students using the Reflective Judgment model of post-adolescent intellectual development (Kitchener & King, 1981). This model posits a seven-stage sequence of changes in assumptions about the sources and certainty of knowledge, and shows how these assumptions affect the ways adults justify their beliefs. This model is designed to apply specifically to ill-structured problems (Churchman, 1971), which are problems that cannot be defined completely (because relevant information is unknown or unavailable), nor solved with a high degree of certainty. In such cases, relying on deductive or inductive logic is unlikely to be sufficient as a problem-solving strategy. Problems related to nuclear waste disposal, pollution, drug addiction, and the safety of chemical additives are examples. The developmental assumptions of this model are presented in Table 1 and are described more completely in King, Kitchener, Davison, Parker, and Wood (1983), King, Kitchener,and Wood (1985), and Kitchener, King, Davison, and Wood (1989).

A second purpose was to ascertain the relationships that exist among students' intellectual development (as measured by the Reflective Judgment model), their academic and social integration (Tinto, 1975), and the noncognitive factors specified by Tracey & Sedlacek (1984). The major questions tested in this study are as follows:

1. Are there differences in intellectual development level, academic and social integration, and the specified noncognitive factors among Black students by class (i.e., freshmen, sophomores, juniors, and seniors) or by gender?

2. To what degree, if any, are differences in intellectual development attributable to academic and social integration, the specified noncognitive factors, or the following background characteristics: high school GPA and rank, ACT score, or socio-economic status (parents' education and occupation, family income)?

3. What are the relationships among students' intellectual development level, their academic and social integration, the specified noncognitive factors, and the selected background characteristics?

Methods

Sample Selection -- Phase I

This study was conducted at a large midwestern state university with an enrollment of 15,300 students. The ethnic enrollment is approximately 5%; 3% of these students are Black. Subject recruitment was coordinated under the auspices of the Office of Minority Affairs. During the 1987 fall semester, all 349 Black undergraduate students (excluding first-term freshmen and transfer students) were identified using institutional information made available from the Office of Admissions. (Transfer students were excluded because of the campus-specific responses on one of the surveys.) These students were contacted by mail and asked to participate in this study by completing and returning an enclosed survey, for which they would receive $10. When each survey was returned, the student was asked to sign a form that granted representatives of the Office of Minority Affairs permission to obtain additional background information from institutional files. (This information is described below.) Nonrespondents were contacted by telephone and encouraged to participate. These combined efforts netted a total of 269 completed surveys, yielding a 77% response rate. Of these, three were not included in the data set, as they were inadvertently sent to and completed by international or transfer students. The

response rates by class level and gender are listedin Table 2. The overall response rate was 78%.

Data collection for new freshmen was postponed until the spring semester of 1988 because the measure of academic and social integration presumes a greater degree of exposure to and experience with the institution than the freshmen would have had during their first semester of enrollment. The same survey was then mailed to the remainder of the freshman class, all 98 Black, non-transfer, first-term freshmen. The same procedures were utilized in processing returned surveys. The initial mailing and follow-up efforts netted a total of 78 completed surveys from new freshmen, for an 80% response rate. The final number of useable surveys across classes totaled 344 (78%).

Sample Selection -- Phase II

A random proportionate sample of respondents stratified by class level was then identified to participate in the Reflective Judgment Interview. It was necessary to identify a sub-sample for this purpose because the time and expense associated with interviewing, transcribing, and rating the RJI precluded the testing of all participants. The sample was selected to yield proportional representation by class of those who had completed the survey, with a goal of 30% of each class or 15 participants for each class by gender cell. The resulting subsample size is broken down by class level and gender in Table 3. In all, 146 students (42% of the total sample) were interviewed. (A larger proportion of freshmen was selected to allow for a longitudinal follow-up in the future.) Participants were paid an additional $10 to complete the interview.

Instruments

Each participant was asked to complete a four--part survey consisting of a section on background information, the Institutional Integration Scale, the Noncognitive Questionnaire, and an Environmental Referent. (These are described below.) As

indicated, a subsample of students also completed the Reflective Judgment Interview; at the conclusion of the interview, they were also asked to explain selected responses on the Institutional Integration Scale.

Background Information. Participants were asked to describe their parents' educational levels and occupations; these were averagd and summed to provide an index of socio-economic status (SES). In addition, students were asked for their permission to obtain the following background information from institutional files: high school GPA and class rank, current college GPA, age, family income, and ACT subtest and composite scores. (All subsequent references to an ACT score refer to the composite score, unless noted otherwise.)

Institutional Integration Scale (IIS). Pascarella and Terenzini (1980) developed a test of institutional integration to provide a more precise measure of the concepts of social and academic integration. They argued that students' background characteristics and goal commitments (e.g., highest degree expected, importance of graduating from college) "influence not only how the student will perform in college, but also how he or she will interact with, and subsequently become integrated into, an institution's social academic systems" (pp. 60-61). The IIS consists of 34 items that are categorized into the following five scales: I) Peer-group Interaction; II) Interactions with Faculty; III) Faculty Concern for Student Development and Teaching; IV) Academic and Intellectual Development; and V) Institutional and Goal Commitments. Items are summed to yield scale scores. The items that comprise these scales are listed in Table 4. Participants respond to these items using a 5-point Likert scale, from strongly disagree (1) to strongly agree (5).

Pascarella and Terenzini (1980) reported alpha reliabilities for the scales from .71-.84, with very low interscale correlations, suggesting that the scales measure relatively independent aspects of institutional integration. This construct has been found to be

positively associated with degree completion (Terenzini & Pascarella, 1980; Pascarella, 1985).

At the conclusion of the IIS items, an environmental referent (Aulepp & Delworth, 1976) was added to the survey to elicit more specific information about those items on the IIS to which students responded strongly. For these items, students were asked to explain what made them feel as they did about a given item, and their suggestions were solicited for improving those situations they would like to see changed. Those who participated in the interview were also asked to discuss selected items from the IIS. (Results from the environmental referent and the IIS portion of the interview will be reported at a later time.)

Noncognitive Questionnaire (NCQ). The Noncognitive Questionnaire (Tracey & Sedlacek, 1985, based on the work of Sedlacek & Brooks, 1976) consists of 28 items: four request background information, one pertains to educational aspirations, and one pertains to reasons for leaving college before receiving a degree. The remaining 22 items are categorized into the following eight scales:

1. global, positive self-concept as related to expectations for the coming years;
2. realistic self-appraisal, especially regarding academic abilities;
3. an understanding of racism (both personal and institutional) and an ability to deal with it;
4. an ability to work toward long-range goals rather than toward more immediate, short-term goals;
5. availability of people who are supportive of one's academic goals;
6. successful leadership experience in either organized or informal groups;
7. demonstrated community service, indicated by involvement in local community or church activities during the years before college; and

8. knowledge obtained in a field, defined as unusual and/or culturally related ways of obtaining information and demonstrating knowledge.

Table 5 lists profiles of high and low scorers on these variables.

Tracey and Sedlacek (1984) report a 2-week test-retest reliability of .85 and an interrater reliability of the open-ended items ranging from .83 - 1.00. Internal consistency coefficients for each scale have not been reported. The NCQ has been found to have good predictive validity with regard to college grades and high predictive validity with regard to academic success and college persistence of Black students (Tracey & Sedlacek, 1985, 1987b).

Reflective Judgment Interview (RJI). The Reflective Judgment Interview (Kitchener & King, 1981) consists of four dilemmas from different intellectual domains (science, current events, history, and religion) and a set of standardized probe questions. The interview is designed to measure ill-structured problem solving (King, Wood, & Mines, in press) based on the Reflective Judgment model. The RJI is administered by a trained interviewer and takes 45-60 minutes to complete. Each dilemma is defined by two contradictory points of view, and participants are asked to state and justify their points of view about the issues. Each dilemma is separately tape recorded, transcribed, and then independently rated by two trained raters according to the Reflective Judgment Scoring Manual (Kitchener & King, 1985). A mean score for each subject is derived by averaging scores from both judges over all dilemmas. (Mean scores correspond to stages: a mean score of 3.0 indicates that the average RJI score for a given subsample was Stage 3; stages are described in Table 1.) Raters for this study were blind to class level and gender of the interviewees. Only three dilemmas were used in order to be able to ask participants questions about their IIS responses during the one-hour interview.

Internal consistency, measured by coefficient alpha, has ranged from .63-.96. Interrater reliability has been moderate to high, depending on the homogeneity of the samples tested (Kitchener, 1986; Mines, 1982).

Results

In this section, results will first be reported by instrument separately. This will be followed by a discussion of the relationships among the research variables.

Institutional Integration Scale (IIS)

The internal consistency reliability for the IIS was .78; interscale correlations ranged from .13 to 27. Scale alphas were as follows: .75, .83, .50, .60 and .78 for Scales I through V, respectively. These are somewhat lower to those reported by Pascarella and Terenzini (1980) and somewhat higher (for scales 1, 2, and 5) than those reported by Fox (1984).

A two-way (class x gender) ANOVA was run on each of the five IIS scales as well as on two additional scales. The additional scales were created using a procedure suggested by McCurdy (1985/1986): a Social Integration scale was formed by summing Scales 1 (Peer Group Interactions) and 2 (Interactions with Faculty); both of these address nonclassroom relationships. An Academic Integration Scale was created by summing the scores from Scales 3 (Faculty Concern for Student Development and Teaching) and 4 (Academic and Intellectual Development). Table 6 reports the means and standard deviations for each of these scales by class level and gender.

On Scale 1 (Peer-Group Interactions), seniors scored significantly higher than freshmen, $F(3, 278)=3.39$, $p=.02$. These scale scores are based on the sum of the seven items for this scale; the average item means were 3.93 and 3.64 for the seniors and freshmen, respectively. A class main effect was also obtained on the Social Integration Scale, with seniors scoring significantly higher than freshmen, $F(3, 289)=2.65$, $p=.049$.

There were no significant differences by gender and no interactions. Class differences remained on both scales when SES, high school GPA, or high school rank were partialled out, but not when university GPA or ACT scores were used as covariates.

Gender differences were found only on Scale 1, and only when university GPA, high school GPA, or ACT scores were used as covariates; females scored higher than males. Class by gender interactions were found on Scales 1 and 5 and the Social Integration Scale when ACT Composite scores were covaried out, on Scale 1 when high school rank was covaried out, and on the Social Integration Scale when SES was covaried out.

The Noncognitive Questionnaire (NCQ)

The NCQ was scored using the revised scoring manual (Abler, Sedlacek, & Tracey, 1988) under special agreement with the authors. Ratings were independently assigned by two raters to the three open-ended questions on 40 of the 344 questionnaires (12%) using the revised scoring manual. Interrater agreement was 79%. Scores were assigned to the remaining open-ended questions by one rater.

The internal consistency of the NCQ was examined using coefficient alpha and item correlations within scales. The overall alpha was .51. However, the scale alphas fell as low as .04 on Scales 2 and 7, and were less than .10 on scales 3 and 4. Using the criterion of .35 as the lowest acceptable level, only Scales 5 (Availability of Strong Support Person), 6 (Successful Leadership Experience), and 8 (Knowledge Obtained in a Field) reached an acceptable level. The obtained alphas for these scales were .43, .39, and .51, respectively. Therefore, NCQ analyses based on scale scores will be reported only for these three scales. Means and standard deviations for all scales are reported by class level and gender in Table 7.

A two-way (class x gender) ANOVA was run on Scales 5, 6, and 8. Standardized T-Scores (M=50, $s.d.$=10) were used as the dependent variables. A main effect for class was

found only on Scale 8 (Knowledge Obtained in a Field), with sophomores, juniors, and seniors scoring significantly higher than freshmen, $F(3, 336=12.10, p<.001$. This pattern remained when SES, university GPA, ACT, High School GPA, and high school rank were used as covariates. A gender main effect was found on Scale 6 (Successful Leadership Experience) with females scoring significantly higher than the males, $F(1,336)=5.07, p=.025$. This effect remained when all covariates listed above were partialled out. Males scored significantly higher than females on Scale 5 (Availability of a Strong Support Person) when ACT Composite was partialled out. No gender by class interactions were found.

The Reflective Judgment Interview

Because the RJI scores are based on the subjective ratings of interview protocols, interrater agreement and reliability coefficients, as well as other psychometric data, will be presented first. Interrater agreement is one of the more conservative measures of the degree to which two raters have assigned comparable ratings to observations (Tinsley and Weiss, 1975). Agreement was calculated by counting the number of times the two raters assigned the same scores to the 438 interview protocols (i.e., the three Reflective Judgment dilemmas x 146 students interviewed). A very high level of interrater agreement was obtained: using the standard definition of agreement as scores that are within one stage difference (see Kitchener et al., 1989 for a description of this procedure), raters were in agreement 99% of the time. The scores assigned to four interview protocols did not meet this criterion; these were blindly rerated. All subsequent analyses are based on the rerated scores.

Interrater reliability, which measures the consistency of scores across raters using a Pearson's r correlation, was .34, $p<.001$. These correlations for the individual dilemmas ranged from .37, $p=.001$, for dilemma 3 (special creation/evolution) to .27, $p=.001$, for

dilemma 2 (objectivity in news reporting), to .19, p=.01, for dilemma 4 (the safety of chemical additives). In light of the high interrater agreement, these low correlations probably reflect the homogeneity of scores found for this sample (discussed below) and the fact that one rater's scores were not consistently higher or lower than the other rater's scores.

The item-total correlations (the correlation between the scores for each dilemma and the scores averaged across the three dilemmas) ranged from .65-.74, p=.001. The internal consistency reliability, using coefficient alpha, was .50. In light of the high interrater agreement and interdilemma consistency, all RJI scores and analyses reported below are based on participants' scores that have been averaged across raters and across dilemmas.

A series of analyses was conducted on the Reflective Judgment scores. First, a two-way (class x gender) ANOVA was run using RJI score as the dependent variable. A main effect for class was found, F (3, 138) = 6.15, p<.001, with no significant differences by gender and no interactions. The mean scores and standard deviations by class and gender are reported in Table 8. (Mean scores correspond to stages: a mean score of 3.0 indicates that the students' assumptions about knowledge and justification of beliefs reflect Stage 3 assumptions as described in Table 1.) A follow-up Scheffe indicated that the seniors' RJI scores were significantly higher than those earned by the freshmen and the juniors. The finding of class differences on RJI scores remained when SES, ACT score, high school GPA, and high school rank were used as covariates. Using the university GPA as a covariate, the main effect for class remained, F(3,131)=6.85, p<.001, but here, a main effect for gender was also found, F (1,131)=4.81, p=.03, with males scoring higher (adjusted M=3.66) than females (adjusted M=3.57). This is surprising since the current GPA was 2.05 for males and 2.30 for females. Information on the relationship between RJI scores and the other measures is presented below.

Relationships between Measures

Correlations were run between the scores of all pairs of scales from the three dependent measures (the RJI, the NCQ and the IIS). These are presented in Table 9. RJI scores correlated significantly with only one NCQ scale, Successful Leadership Experience, and this correlation was low and negative. Three positive correlations were found between IIS scales and the RJI: IIS2 (Interactions with Faculty), IIS4 (Academic and Intellectual Development), and Social Integration; these were also rather weak ($r<.20$).

Correlations between NCQ and IIS scores were variable. NCQ5 (Availability of a Strong Support Person) correlated negatively and significantly with all IIS scales except one; r's ranged from -.14 to -.20. The strongest of these correlations ($p<.001$) were between this variable and IIS1 (Peer-Group Interactions) and IIS5 (Institutional and Goal Commitments). The only other highly significant correlation was between NCQ6 (Successful Leadership Experience) and the Social Integration Scale. The remaining correlations were also predominanly low and negative.

A series of two-way ANOVAs (class by gender) were run on RJI scores using IIS and NCQ scales as covariates to determine if the class main effect found on the RJI could be attributable to these variables. The class main effect remained significant in every case.

Table 10 reports the correlations between each of the dependent variables and the following student background characteristics: ACT English, ACT Math, ACT Social Science, ACT Natural Science, ACT Composite Score, university GPA, high school GPA, high school rank, SES, and family income. The RJI correlated significantly with only one of the academic ability measures, the ACT natural science subtest. It also correlated positively and significantly with university GPA, however, the significant correlations with high school GPA and rank were negative.

NCQ5 (Availability of a Strong Support Person) correlated negatively with ACT English, university GPA and SES. The Successful Leadership Scale (NCQ6) and the Knowledge Obtained in a Field (NC8) correlated negatively with every variable listed except family income, which was not significant.

Five of the seven IIS scales correlated significantly with the ACT English subtest scores. Scale 3 (Faculty Concern for Student Development and Teaching) also correlated positively and moderately with the ACT Social Science subtest and the ACT Composite score. Low but significant correlations were found between this scale and university GPA and high school rank. No significant correlations were found between Scale 2 (Interactions with Faculty Members) and ACT scores.

Discussion

Despite the sizeable literature that exists on college student development, there remains a considerable void in the existing literature on the development of minority students. Development in the intellectual domain is currently of particular interest because it represents a central goal for virtually all institutions of higher education (e.g., Carnegie Foundation for the Advancement of Learning, 1977) and because academic and intellectual problems are consistently reported as being central factors related to minority student attrition (e.g., Donovan, 1984; Gosman et al., 1983). Other non-academic factors (e.g., social integration or those measured by the NCQ) may, in turn, affect students' intellectual development by decreasing the intensity (depth) and extensity (length of time) of their exposure to and involvement within the intellectual milieu of the campus. This study was designed to allow for the investigation of both academic and non-academic factors that are posited to affect Black students' intellectual development, as well as their adjustment to and satisfaction with the university environment. Interpretation of these results should be done in recognition of the fact that this study was conducted at a large state university that has a

very small proportion of Black students (approximately 3%). (In fact, the population of senior Black males was only 28.) Black students' intellectual development, as well as the related academic and non-academic factors, may be different for other samples of Black students.

The response rate in this study (78%) is itself noteworthy. Vannnorsdall (1989) has compiled an extensive review of the literature on the collegiate experience of Black students, and convincingly documents the problems researchers have found when they attempted to use mailed surveys with samples of Black undergraduates. Fleming (1984) describes promoting participation in her study using campus radio stations and sponsoring campus dances to yield acceptable response rates, with mixed results. Even prior studies of academic and social integration on this campus with strong insitutional support (McCurdy, 1985/86) had low response rates among Black students (33%). Because a low response rate would have jeopardized interpretation of results on the questions of interest here, extensive financial resources were allocated to the data collection phase of the study. While a seemingly disproportion amount of the cost of this study was used for subject payment, the response rate is quite adequate, and easily twice as high as that reported by other researchers (Vannorsdall, 1989). Offering such incentives may be a necessary price to pay for this type of research, at least in the near future.

Institutional Integration Scale

The major findings from the examination of class and gender differences on the IIS scales in this study were the class differences found on the Peer Group Interactions scale and on the Social Integration Scale, with seniors scoring somewhat higher than freshmen. Their mean scores indicated that seniors were likely to respond with the "agree" option, while the freshmen were less positive regarding their peer group interactions: their scores averaged between "not sure" and "agree." These scores were comparable to those found in

a previous study at this institution (McCurdy, 1985/86). Tinto's concepts of academic and social intergration have more commonly been used to predict retention (e.g., Terenzini & Pascarella, 1980); such studies typically do not report raw scores or differences by groups. Therefore, it cannot be said whether these results are comparable to those found in previous studies at other institutions. Nevertheless, it seems plausible that seniors, those who are academic "survivors", would feel more a part of the institution, and that this feeling would be reflected in higher institutional integration scores. That these students report higher levels of integration only on the peer interaction and social integration scales rather than on the more academically oriented scales, suggests the importance of peer support and informal faculty contacts with faculty as they relate to college "survival."

Fox (1984) reported that reading comprehension posed problems for a sample of college students with low reading ability who took the IIS. He found that item-subscale correlations and internal consistency improved markedly when negatively worded items were rephrased, and when unfamiliar words (e.g., "interactions") were replaced with more familiar synonyms (e.g., "contacts"). Based on comments made during the interview phase of this study, several items appear to have been misunderstood in this study as well. Other researchers are encouraged to consider this potential problem when designing and administering studies using the IIS.

The Noncognitive Questionnaire

As a result of low internal consistency reliabilities on the NCQ, analyses could only be run on three of the eight scales. This reduced the usefulness of the instrument and hindered interpretation of the NCQ findings. W. E. Sedlacek (personal communication, July 5, 1989) reported an overall internal consistency reliability of .83, much higher than that obtained here. Scale alphas from other samples have not been reported.

For the three scales where the coefficient alphas were high enough for analysis, class by gender ANOVAs were run to examine students' patterns of scores. As with the IIS, research on the NCQ has focused on predicting students' academic success, and group means are not typically reported. Nevertheless, it is plausible to expect higher scores among those who have successfully negotiated the university system, i.e., seniors. However, a class main effect was found only for Scale 8, Knowledge Obtained in a Field. This finding may reflect the fact that seniors have had a greater variety of learning experiences, including contact with different types of offices and organizations. Alternatively, this effect may reflect greater goal clarity, which is also typically higher among seniors (Chickering, 1969). A gender main effect was obtained on Scale 6 (Successful Leadership Experience), with females scoring higher. Abler et al (1988) point out that this factor "refers tothe minority student's demonstrated ability to organize and influence others within his or her culutrul-racial context" (p. 14). This finding may be another reflection of Fleming's (1983) observation that Black women on predominantly White campuses tend to be more independent, self-reliant, and assertive than their counterparts at predominantly Black colleges. They may also fulfill affiliative needs and altruistic interests through community service activities.

The names of several NCQ scales are inconsistently used across publications describing the scales. For example, NCQ8 (Knowledge Obtained in a Field) is defined as "unusual and/or culturally related ways of obtaining information and demonstrating knowledge. The field itself may be nontraditional" (Abler et al., p. 15). This factor is referred to elsewhere (Tracey & Sedlacek, 1985) as " academic familiarity", defined as "the extend to which a student's extracurricular activities and interests are related to formal academic subjects" (p. 406) This definitional problem is also reflected in the measurement of the scale. The scale is based on two open-ended questions: a) a listing of three goals the

student currently holds; and b) a listing of offices held and/or groups to which the student belongs. These questions appear to reflect leadership opportunities and goal clarity rather than ways of obtaining and demonstrating knowledge. Thus, the meaning of the construct as defined and measured is not clear, and therefore lacks face validity.

Reflective Judgment Interview

Prior to this study, a sample of minority college students had not been tested on the RJI. Virtually all prior studies examining class differences have found that RJI scores increased with educational level; this pattern was repeated with this sample. Further, these differences were not attributable to the academic or social integration, nor to Tracey & Sedlacek's (1984) noncognitive factors.

In their ten-year review of Reflective Judgment research, Kitchener and King (in press) reported the following progression of scores across college samples: freshmen , M=3.60, (n=216); sophomores , M=3.40, (n=30); juniors, M=3.58 (n=100); seniors, M=3.99, (n=257). The class mean scores obtained in this study are comparable to those found in previous studies, falling in the middle of the range of class scores from other studies reported by Kitchener and King. Only the seniors varied somewhat from this pattern: their scores fell in the lower third of the range of senior class scores.

However, while these class differences on the RJI between freshmen and seniors are significant, they are not large. Further, the assumptions of Stages 3 and 4 that the majority of students in this sample hold are not consistent with the skills of reflective thinking that are commonly associated with critical thinking as a central aim of education (King, Wood, & Mines, in press). At these stages, beliefs are not consistently defended by reference to evidence, and evidence is not explicitly identified as an important tool in making interpretations or judgments. Further, judgments about ill-structured problems are seen as idiosyncratic to the individual because there is no certain way to adjudicate between

competing claims. While holding such assumptions seems to provide a developmental stepping stone in the progression to stages that are characterized by less relativistic assumptions, they do not reflect the assumptions of high level critical thinking that are espoused for students in most college catalogues.

Interrelationships among Instruments

No systematic pattern of relationships was found between or among the three major variables of interest (IIS, NCQ and RJI) in this study, suggesting that the three instruments measure distinct features of students' collegiate experiences. One consistent pattern of negative correlations was found between NCQ5 (Availability of a Strong Support Person) and eight of the other nine variables. This is surprising, in light of recent interest in mentoring, and the importance of "interpersonal affiliation" in students' adjustment and academic success (Tinto, 1987). A low but significant negative correlation was also obtained between this variable and university GPA, a common indicator of academic success. Two of the three items that comprise this scale focused on the support of family members and friends; it may be that support from those on campus or those more familiar with the demands and expectations of college life provide the kind of support necessary for academic success.

Future Research

The major questions of this study regard intellectual development and the factors that are associated with this aspect of the development of college students . For this phase of the research, a cross-sectional design was used to examine posited differences by academic class. A stronger test would employ a longitudinal design to control for cohort effects. This follow-up is currently in the planning stages.

Second, a more fine-grained examination of these results is planned. These results are reported by scale; other informative results may be discovered when the analyses are

examined by specific items. This will be especially important for the NCQ, where only three of the eight scales had high enough internal consistency reliability to be analyzed by scale.

As noted above, future analyses will also include examination of the IIS scores in light of students' explanation of these items in the interview. These should provide additional information to that noted by Fox (1984) about students' understanding of items with unfamiliar words (e.g., "faculty") and negatively-worded items.

Other planned analyses will compare the results of new and continuing freshmen. Because many of minority students on this campus attend the university for five or more years, the pattern of responses by age and length of attendance will also be examined.

Conclusion

This paper has presented the preliminary findings from a study of the intellectual development of Black students on a predominantly White campus, and of several noncognitive variables posited to be associated with intellectual development and academic success. While there is relatively little data to inform this question, especially among minority student samples, it seems intuitively reasonable that factors associated with students' perceptions of the learning environment (e.g., degree of comfort, willingness to take intellectual risks, feelings of belonging, the support of adults who are important to the student) will affect their intellectual development. This study is one attempt to improve our understanding of how these factors affect student learning and development.

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Characteristic Assumptions of Reflective Judgment Stages, with Examples

Stage 1

Stage 1 is characterized by a concrete, single category belief system, that is, what I observe to be true *is* true. This represents a copy view of knowledge, that is, the belief that there is an absolute correspondence between what is perceived and what is. Beliefs require little or no justification since it is assumed that one must only observe to know the truth. Knowledge and belief are indistinguishable, they simply exist. Since knowledge is absolute and predetermined, judgments which presume uncertainty are not made. Thinking appears naive and simplistic.

View of Knowledge. Knowledge is assumed to exist absolutely and concretely, thus knowledge can be obtained with absolute certainty through direct observation.

Example

"If scientific studies say these chemicals cause cancer, then, yes, they cause cancer."

Concept of Justification. Beliefs need no justification since there is assumed to be an absolute correspondence between what is believed and what is true.

Example

"Mostly, I hear it and believe it because I figure if it's on the news, it's got to be true or they wouldn't put it on."

Stage 2

Stage 2 is characterized by the belief that while certain knowledge can be obtained, not everyone has access to it. Certain knowledge is seen as the domain of authorities who are presumed to know the truth, for example, scientists, teachers, priests. When pre-existing answers do not already exist or cannot be learned by simple observation, beliefs are justified by copying the views of an authority. The admission that knowledge may not be directly and immediately known represents an advancement over stage 1. The individual moves from an egocentric, single-category belief system, "What I observe is true," to a two-category belief system: some beliefs are right and others are wrong.

View of Knowledge. Knowledge is absolutely certain or certain but not immediately available. Knowledge can be obtained via direct observation or via authorities.

Example

"If scientists prove that it causes cancer and if they put it on TV, on national news, and that it's against a big company, then the company has got to be doing something wrong because the big companies would sue if it was wrong."

Concept of Justification. Beliefs are unexamined, unjustified or justified by reference to authority. Most issues are assumed to have a right answer.

Example

"Some people believe that we evolved from apes and that's the way they want to believe, but I just feel it's wrong for anybody to believe that way. I would never believe that way and nobody could talk me out of the way I believe because I believe the way, you know, it's told."

Stage 3

Stage 3 is distinguished by the acknowledgement that knowledge may be temporarily inaccessible even to legitimate authorities. The belief that absolute knowledge will be obtained through concrete data at some future point is maintained. In the meantime, while evidence is incomplete, no one (including authorities) can claim to "know" beyond his or her own personal impressions or feelings. Therefore, in areas of uncertainty, beliefs can be justified only on the basis of what "feels right" or what an individual wants to believe at that moment. Such claims are basically a-rational. Stage 3 offers a further expansion of the categories over stage 2: true knowledge, false claims and uncertain claims. Alternative conceptions of reality, diverse points of view, or different theories are assimilated as areas of uncertain knowledge.

View of Knowledge. Absolute knowledge can be obtained in some specialized cases (e.g., science or religion) via authority, but in other areas knowledge is temporarily uncertain. In areas of temporary uncertainty we can know only via intuition and bias until absolute knowledge is obtained.

Example

"Right now they are finding things about the pyramids that can't be explained. Right now they are just guessing. Maybe another life form helped build them and others said humans did. Until there is evidence that people can give to convince everybody one way or another, it's just a guess. Then it will be knowledge."

Concept of Justification. While knowledge is temporarily uncertain, a point of view is merely an opinion since there is no rational way to justify beliefs.

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When knowledge becomes certain, authorities will have it
Example

S Well, I just do not think that people from other planets came down and helped them (the Egyptians)
I How did you go about deciding (that)?
S I guess I just kind of didn't believe it, didn't base it on facts. Nobody has such facts

Stage 4

Stage 4 is characterized by the belief that knowledge is not certain. The reasons given are concrete and specific, for example, that an event happened too far in the past for us to have direct knowledge of it. Since there are many possible answers to every question, but no absolutely certain way to adjudicate between answers, knowledge claims are understood as being idiosyncratic to the individual. What is true for one person is then not necessarily true for the next. Stage 4 provides an advancement over stage 3 in the admission that certainty is not just a temporary condition of the knowing process. The category "uncertain" has become further differentiated and generalized, and the former categories of right and wrong knowledge are seen as special exceptions rather than as general categories of knowing.

View of Knowledge. Knowledge is uncertain and idiosyncratic since situational variables (e.g., incorrect reporting of data, data lost over time) dictate that we cannot know with certainty. We can know only through individual evaluation of data and belief.
Example

"I'd be more inclined to believe evolution if they had proof. It's just like the pyramids. I don't think we'll ever know. People will come up with different interpretations because people will differ. Who are you going to ask? No one was there."

Concept of Justification. Because beliefs are idiosyncratic to individuals' perspectives, almost any reason may be used to justify holding a belief. Decisions may come across as somewhat arbitrary although partially reasoned or as if they have been cut and pasted together.
Example

"I've had several anthropology courses and all the cultures we studied are more advanced than the Egyptians. I read *Chariots of the Gods*. Some people say "ah ah" but I'm more scientific than mystical. I tend to look at facts rather than other evidence."

Stage 5

Stage 5 is distinguished by the belief that objectively knowledge does not exist and we can know only within a context through subjective interpretation of data, a belief occasionally labeled "relativism" by subjects. The logic is that knowledge is related to evidence, evidence is known indirectly via interpretation, and interpretation derives from context, therefore, knowledge is contextual. A major advancement of stage 5 over stage 4 is the ability to evaluate an argument (e.g., an ecologist's view) by judging the relative merits of its parts, that is, the various pieces of evidence and their coherency. This allows the individual to move beyond the idiosyncratic justifications of stage 4 and to see justification as the process of making legitimate interpretations within a particular perspective.

View of Knowledge. Knowledge is contextual and subjective. Since what is known is known via perceptual filters, we cannot know directly. We may know only interpretations of the material world.
Example

"I think every person interprets things through their own eyes and through their own experience. Even in something as concrete as a table, you know, if I had just said the word 'table,' we'd all have an idea of what a table looks like from our experience and our background. If you take someone from an entirely different background, entirely different experiences, and you said the word "table" they might picture some squatty little thing that's a foot above the ground or floor. And so, I think that we're all drawing from our own experiences and background and our own ideas on the matter based from what we know."

Concept of Justification. Beliefs are justified within a particular context by the rules of inquiry for that context. Justifications are assumed to be context specific; thus, choosing between competing interpretations is often resisted.
Example

"If I had to make a decision, I would work to find more data tracing what we do know about evolution and see if I could find a scientific inquiry that would lead to a clear pattern of evolution. If I did back up, I still wouldn't know because I wouldn't know if a driving force—a God—created the original man or the end of the trace. I'd have a really hard time knowing the actuality of one or another. On the other hand, I'd have a really hard time knowing that man was created out of nothing by a divine being. To know that, I could have faith."

Stage 6

Stage 6 is distinguished by the belief that while knowledge must be understood in relationship to context and evidence, some judgments or beliefs may nevertheless be judged as better than others. This claim is based on the ability to coordi-

nate and compare relationships across contexts rather than on relationships that are specific to a context, for example, knowing and justification in context A can be compared and contrasted to knowing and justification in context B. Individuals begin to suggest that some points of view may be justified as better founded or more rational and reasonable than others. Further, inquiry itself is now viewed as a process, the product of which changes as the inquiry progresses. A major advancement of stage 6 over stage 5 is the ability to see relationships between subcategories in different domains and combine them in an abstract system.

View of Knowledge. Knowledge is personally constructed via evaluation of evidence, opinions of others, and so forth across contexts, and from multiple perspectives, thus we may know our own and other's personal constructions of issues.

Example

> "I study social science, and ideas rather than "truth" are important. Creationism and evolution are sets of ideas that have evolved from different positions, one religious and the other scientific. Truth is defined by people who state what truth is so it's very hard to argue against one or the other and to present supporting statements, philosophies . . . but that's what it is, coherent type of logical patterns."

Concept of Justification. Beliefs are justified by comparing evidence and opinion on different sides of an issue or across contexts, and then constructing solutions which are evaluated by personal criteria (e.g., one's personal values or the pragmatic need for actions).

Example

> "If I did have more complete information and data that I gathered which seemed to indicate that there was more evidence that the Egyptians had built the pyramids, I would have to say that this is not an absolute right answer and the other a wrong answer, but there is more evidence in this direction than the other and in this sense this explanation would be more accurate than the other."

Stage 7

Stage 7 is characterized by the belief that while reality is never a "given," facts and interpretations of those facts can be constructed into evaluated knowledge claims about the nature of the problems under consideration that are epistemically justifiable. Knowledge must be constructed via critical inquiry or through the synthesis of existing views and evidence. Using these processes, it is possible to determine that some judgments or interpretations have greater truth value than others and/or to suggest that a judgment can be justified as the most reasonable solution for a problem, understanding that in the future, with the

collection of more data or changes in the world, they may need to reformulate their point of view.

View of Knowledge. Knowledge is constructed via the process of reasonable inquiry into generalizable conjectures about the problem at hand, for example, which interpretation seemed most probable based on the current evidence.

Example

> "You can't be sure of anything in this life. It's very difficult in this life to be sure—there are degrees of sureness—you come to a point at which you are sure enough for a personal stance on an issue. I would decide this issue on the basis of evidence - that would play a substantial part, other personal motivation may come in. Right and wrong are uncomfortable categories to assign to this kind of item. More or less likely or reasonable, more or less in keeping with what the facts seem to be would be better categories."

Concept of Justification. Beliefs are justified probabilistically via evidence and argument using generalizable criteria, for example, which argument offers the most complete or compelling understanding of an issue.

Example

> "One can argue here that one is a better argument than the other. One is more consistent with the with the evidence—what I really am after is a story that is in some sense intelligible and is as intelligible as possible. So it's trying to fit the pieces together in some kind of a narrative framework that makes sense in a maximum way and that means adding a piece here and reinterpreting what I thought up until then and then adding another piece and so forth. So it's very much a—, I don't think it's as much of a puzzle solving as it is trying to get the narrative straight."

From: Kitchener, K. S., King, P. M., Wood, P. K. & Davison, M. L. (1989). Sequentiality and consistency in the development of Reflective Judgment: A six-year longitudinal study. Journal of Applied Developmental Psychology, 10, 73-95.

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Table 2. Survey Response Rates by Class and Gender

	Male			Female			TOTAL		
	n	N	%	n	N	%	n	N	%
New Freshmen	25	38	65.8	53	60	88.3	78	98	79.6
Continuing Freshmen	33	43	76.7	37	46	80.4	70	89	78.6
Sophomores	37	40	92.5	51	58	87.9	88	98	89.8
Juniors	15	30	50.0	40	50	80.0	55	80	68.8
Seniors	18	28	64.3	35	50	70.0	53	78	67.9
TOTAL	128	179	71.5	216	269	81.8	344	443	77.6

Note. n=number of respondents; N = number of students in the population.

Table 3. Interview Sample Size by Class and Gender

	Male			Female			TOTAL		
	n	N	%	n	N	%	n	N	%
New Freshmen	19	25	76.0	22	53	41.5	41	78	52.6
Continuing Freshmen	10	33	33.3	16	37	43.2	26	70	37.1
Sophomores	17	37	45.9	15	51	29.4	32	88	36.4
Juniors	11	15	73.3	15	40	37.5	26	55	47.3
Seniors	11	18	61.1	10	35	28.6	21	53	39.6
TOTAL	69	128	53.9	78	216	36.1	146	344	42.4

Note. n=number of students who completed the follow-up interview; N=number of survey respondents.

Table 4. Institutional Integration Scales

Scale I: Peer-Group Interactions

Since coming to this university, I have developed close personal relationships with other students.

The student friendships I have developed at this university have been personally satisfying.

My interpersonal relationships with other students have had a positive influence on my personal growth, attitudes, and values.

My interpersonal relationships with other students have had a positive influence on my intellectual growth and interest in ideas.

It has been difficult for me to meet and make friends with other students.

Few of the students I know would be willing to listen to me and help me if I had a personal problem.

Most students at this university have values and attitudes different from my own.

Scale II: Interactions with Faculty

My nonclassroom interactions with faculty have had a positive influence on my personal growth, values, and attitudes.

My nonclassroom interactions with faculty have had a positive influence on my intellectual growth and interest in ideas.

My nonclassroom interactions with faculty have had a positive influence on my career goals and aspirations.

Since coming to this university, I have developed a close, personal relationship with at least one faculty member.

I am satisfied with the opportunities to meet and interact informally with faculty members.

Table 4, continued

Scale III: Faculty Concern for Student Development and Teaching

Few of the faculty members I have had contact with are generally interested in students.

Few of the faculty members I have had contact with are generally outstanding or superior teachers.

Few of the faculty members I have had contact with are willing to spend time outside of class to discuss issues of interest and importance to students.

Most of the faculty I have had contact with are interested in helping students grow in more than just academic areas.

Most faculty members I have had contact with are genuinely interested in teaching.

Scale IV: Academic and Intellectual Development

I am satisfied with the extent of my intellectual development since enrolling in this university.

My academic experience has had a positive influence on my intellectual growth and interest in ideas.

I am satisfied with my academic experience at this university.

Few of my courses this year have been intellectually stimulating.

My interest in ideas and intellectual matters has increased since coming to this university.

I have performed academically as well as I anticipated I would.

Scale V: Institutional and Goal Commitments

It is important for me to graduate from college.

I am confident that I made the right decision in choosing to attend this university.

It is likely that I will register at this university next fall.

It is not important to me to graduate from this university.

I have no ideas at all what I want to major in.

Getting good grades is not important to me.

Table 5

PROFILES OF HIGH AND LOW SCORERS ON NON-COGNITIVE VARIABLES

	HIGH SCORE	LOW SCORE
1. POSITIVE SELF-CONCEPT OR CONFIDENCE	Feels confident of making it through graduation. Makes positive statements about him/herself. Expects to do well in academic and non-academic areas. Assumes he/she can handle new situations or challenges.	Can express reason(s) why he/she might have to leave school. Not sure he/she has ability to make it. Feels other students are better than he/she is. Expects to get marginal grades. Feels he/she will have trouble balancing personal and academic life. Avoids new challenges or situations.
2. REALISTIC SELF-APPRAISAL	Appreciates and accepts rewards as well as consequences of poor performance. Understands that reinforcement is imperfect, and does not overreact to positive or negative feedback. Has developed a system of using feedback to alter behavior.	Not sure how evaluations are done in school. Overreacts to most recent reinforcement (positive or negative), rather than seeing it in a larger context. Does not know how he/she is doing in classes until grades are out. Does not have a good idea of how peers would rate his/her performance.
3. UNDERSTANDS AND DEALS WITH RACISM	Understands the role of the "system" in his/her life and how it treats minority persons, often unintentionally. Has developed a method of assessing the cultural/racial demands of the system and responding accordingly: assertively, if the gain is worth it, passively if the gain is small or the situation is ambiguous. Does not blame others for his/her problems or appear as a "Pollyanna" who does not see racism.	Not sure how the "system" works. Preoccupied with racism or does not feel racism exists. Blames others for problems. Reacts with same intensity to large and small issues concerned with race. Does not have a method of successfully handling racism that does not interfere with personal and academic development.
4. PREFERS LONG-RANGE GOALS TO SHORT-TERM OR IMMEDIATE NEEDS	Can set goals and proceed for some time without reinforcement. Shows patience. Can see partial fulfillment of a longer term goal. Is future and past oriented, and does not just see immediate issues or problems. Shows evidence of planning in academic and non-academic areas.	Lack of evidence of setting and accomplishing goals. Likely to to proceed without clear direction. Relies on others to determine outcomes. Lives in present. Does not have a "plan" for approaching a course, school in general, an activity, etc. Goals which are stated are vague and unrealistic.
5. AVAILABILITY OF STRONG SUPPORT PERSON	Has identified and received help, support and encouragement from one or more specific individuals. Does not rely solely on his/her own resources to solve problems. It is not a "loner." Willing to admit that he/she needs help when appropriate.	No evidence of turning to others for help. No single support person, mentor, or close advisor can be identified. Does not talk about his/her problems. Feels he/she can handle things on his/her own. Access to previous support person may be reduced or eliminated Is not aware of the importance of a support person.
6. SUCCESSFUL LEADERSHIP EXPERIENCE	Has shown evidence of influencing others in academic or non-academic areas. Comfortable providing advice and direction to others. Has served as mediator in disputes or disagreements among colleagues. Comfortable taking action where called for.	No evidence that others turn to him/her for advice or direction. Non-assertive. Does not take initiative. Overly cautious. Avoids controversy. Not well known by peers.
7. DEMONSTRATED COMMUNITY SERVICE	Identified with a group which is cultural, racial and/or geographic. Has specific and long-term relationships in a community. Has been active in community activities over a period of time. Has accomplished specific goals in a community setting.	No involvement in cultural, racial or geographical group or community. Limited activities of any kind. Fringe member of group(s). Engages more in solitary rather than group activities (academic or non-academic)
8. Knowledge acquired in a field	Knows about a field or area that he/she has not formally studied in school. Has a non-traditional possibly culturally or racially-based view of a field. Has developed innovative ways to acquire information about a given subject or field.	Appears to know little about fields or areas he/she has not studied in school. No evidence of learning from community or non-academic activities. Traditional in approach to learning. Has not received credit-by-examination for courses. Not aware of credit-by-examination possibilities.

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Table 6. Institutional Integration Scores by Class and Gender

	Class											
	Freshman			Sophomore			Junior			Senior			TOTAL		
Gender	M	s.d.	n	M	s.d.	n	M	s.d	n	M	s.d.	n	M	s.d.	n
IIS1--Peer-Group Interactions															
Males	24.4	4.6	54	25.3	5.0	35	25.8	6.5	15	28.9	2.5	18	25.5	5.0	122
Females	26.2	4.4	87	26.3	5.0	48	26.7	3.3	39	26.8	3.0	35	26.4	4.2	209
TOTAL	25.5	4.6	141	25.9	5.0	83	26.5	4.4	54	27.5	3.0	53	26.1	4.5	331
IIS2--Interactions with Faculty															
Males	15.0	2.7	57	14.8	3.9	37	17.4	3.5	14	17.0	4.7	18	15.5	3.6	126
Females	15.5	4.5	87	15.4	4.1	50	15.7	4.6	40	15.9	5.0	35	15.6	4.5	212
TOTAL	15.3	3.9	144	15.1	4.0	87	16.1	4.4	54	16.2	4.9	53	15.5	4.2	338
IIS3--Faculty Concern for Student Development and Teaching															
Males	16.0	2.2	55	16.1	2.5	34	15.3	3.1	15	15.9	3.7	18	15.9	2.6	122
Females	16.2	2.6	87	16.1	3.2	47	15.5	3.4	38	15.5	3.3	30	15.9	3.0	202
TOTAL	16.1	2.4	142	16.1	2.9	81	15.4	3.3	53	15.6	3.3	48	15.9	2.8	324

Table 6, continued

	Class														
	Freshman			Sophomore			Junior			Senior			TOTAL		
Gender	M	s.d.	n	M	s.d.	n	M	s.d	n	M	s.d.	n	M	s.d.	n
IIS4--Academic and Intellectual Development															
Males	22.2	3.5	57	22.9	3.5	34	21.6	4.8	13	23.4	4.2	18	22.5	3.8	122
Females	22.8	4.5	85	23.0	4.0	47	23.0	3.8	40	23.7	4.2	34	23.0	4.2	206
TOTAL	22.6	4.1	142	23.0	3.8	81	22.7	4.1	53	23.6	4.2	52	22.8	4.0	328
IIS5--Institutional and Goal Commitments															
Males	20.3	3.4	53	21.6	2.8	32	21.7	2.5	14	21.6	2.6	18	21.0	3.0	177
Females	21.4	2.7	86	21.0	2.3	50	22.2	2.0	40	21.1	2.3	34	21.4	2.5	210
TOTAL	21.0	3.0	139	21.2	2.5	82	22.1	2.1	54	21.3	2.4	52	21.3	2.7	327
Social Integration (IIS1+IIS2)															
Males	39.2	5.8	53	40.3	7.0	35	42.7	8.1	14	45.9	5.5	18	41.0	6.8	120
Females	41.6	7.4	84	41.6	6.2	47	42.2	6.3	39	42.6	6.1	35	41.9	6.7	205
TOTAL	40.7	6.9	137	41.1	6.5	82	42.4	6.8	53	43.8	6.1	53	41.6	6.7	325
Academic Integration (IIS3+IIS4)															
Males	38.2	3.6	54	39.1	4.5	32	37.3	7.3	13	39.3	5.9	18	38.6	4.7	117
Females	38.9	5.5	82	39.4	6.3	43	38.4	5.4	38	38.7	6.1	29	38.9	5.7	192
TOTAL	38.7	4.8	136	39.3	5.6	75	38.2	5.9	51	39.0	6.0	47	38.8	5.4	309

Table 7. Noncognitive Questionnaire Scores by Class and Gender

	Class											
	Freshman			Sophomore			Junior			Senior			TOTAL		
Gender	M	s.d.	n	M	s.d.	n	M	s.d	n	M	s.d.	n	M	s.d.	n
NCQ1--Positive Self-Concept															
Males	27.2	10.0	58	24.8	8.7	37	27.1	8.1	15	27.2	6.8	18	26.5	9.0	128
Females	28.1	11.4	90	29.3	10.1	51	26.0	8.6	40	29.6	11.0	35	28.2	10.6	216
TOTAL	27.8	10.8	148	27.4	9.8	88	27.3	8.4	55	28.8	9.8	53	27.6	10.0	344
NCQ2--Realistic Self-Appraisal															
Males	39.9	9.3	58	41.8	11.1	37	43.3	6.1	15	42.5	10.1	18	41.2	9.6	128
Females	40.4	8.2	90	41.1	10.0	51	40.2	10.2	40	42.4	8.7	35	40.8	9.1	216
TOTAL	40.2	8.6	148	41.4	10.4	88	41.0	9.3	55	42.4	9.1	53	41.0	9.3	344
NCQ3--Understands and Deals with Racism															
Males	20.7	10.8	56	20.7	8.5	36	21.3	9.9	14	17.0	8.3	17	20.2	9.7	123
Females	19.5	12.1	88	18.5	7.9	49	16.4	8.8	38	16.4	9.3	34	18.2	10.2	209
TOTAL	19.9	11.6	144	19.4	8.2	85	17.7	9.2	52	16.6	8.9	51	19.0	10.1	332

Table 7, continued

	Class														
	Freshman			Sophomore			Junior			Senior			TOTAL		
Gender	M	s.d.	n	M	s.d.	n	M	s.d	n	M	s.d.	n	M	s.d.	n
NCQ4--Prefers Long-Range Goals to Short-Term or Immediate Needs															
Males	32.9	10.3	58	38.5	9.2	37	34.2	7.8	15	28.6	9.6	18	34.1	10.0	128
Females	36.0	10.6	90	33.9	7.6	51	33.6	7.5	40	35.8	8.2	35	35.0	9.0	216
TOTAL	34.8	10.5	148	35.8	8.6	88	33.8	7.5	55	33.4	9.3	53	34.7	9.4	344
NCQ5--Availability of Strong Support Person															
Males	2.4	11.8	58	3.3	11.2	37	.6	10.5	15	6.3	16.5	18	3.0	12.2	128
Females	.3	11.4	90	1.6	13.0	51	4.0	11.2	40	.3	13.2	35	1.3	12.1	216
TOTAL	1.1	11.6	148	2.3	12.2	88	3.1	11.0	55	2.35	14.6	53	1.9	12.1	344
NCQ6--Successful Leadership Experience															
Males	39.4	8.0	58	38.9	7.0	37	37.5	10.2	15	38.0	8.7	18	38.8	8.0	128
Females	41.9	9.7	90	40.7	8.6	51	41.8	7.4	40	38.2	9.6	35	41.0	9.1	216
TOTAL	40.9	9.1	148	40.0	8.0	88	40.6	8.4	55	38.1	9.2	53	40.2	8.8	344
NCQ7--Demonstrated Community Service															
Males	33.7	10.2	58	36.0	8.5	37	40.1	10.6	15	30.9	6.0	18	34.7	9.5	128
Females	33.2	9.8	90	33.6	8.7	51	35.8	10.8	40	37.0	9.3	35	34.4	9.7	216
TOTAL	33.4	9.9	148	34.6	8.7	88	37.0	10.8	55	34.9	8.7	53	34.5	9.6	344

Table 7, continued

	Class														
	Freshman			Sophomore			Junior			Senior			TOTAL		
Gender	M	s.d.	n	M	s.d.	n	M	s.d	n	M	s.d.	n	M	s.d.	n
NCQ8--Knowledge Obtained in a Field															
Males	52.6	11.5	58	60.5	6.4	37	61.2	6.2	15	58.4	11.6	18	56.7	10.4	128
Females	55.0	10.0	90	59.2	11.1	51	62.3	8.3	40	60.9	10.5	35	58.3	10.4	216
TOTAL	54.0	10.6	148	59.8	9.4	88	62.0	7.8	55	60.0	10.8	53	57.7	10.4	344

Table 8. Reflective Judgment Interview Scores by Class and Gender

	Class											
	Freshman			Sophomore			Junior			Senior			TOTAL		
Gender	M	s.d.	n	M	s.d.	n	M	s.d	n	M	s.d.	n	M	s.d.	n
Males	3.55	.12	30	3.64	.20	17	3.59	.15	11	3.74	.23	11	3.61	.18	69
Females	3.54	.11	38	3.62	.15	15	3.52	.14	15	3.62	.10	10	3.56	.13	78
TOTAL	3.54	.11	68	3.63	.17	32	3.55	.14	26	3.68	.19	21	3.58	.15	146

Table 9. Intercorrelation Matrix of RJI, NCQ and IIS Scores

Variables	RJI	NCQ5	NCQ6	NCQ8	IIS1	IIS2	IIS3	IIS4	IIS5	SocInt	AcInt
NCQ5	-.04 (146)	1.00									
NCQ6	-.16* (146)	.23*** (346)	1.00								
NCQ8	.05 (146)	-.11* (346)	.08 (346)	1.00							
IIS1	.09 (136)	-.20*** (332)	-.15** (332)	.10* 332)	1.00						
IIS2	.16* (144)	-.06 (340)	-.17** (340)	.06 (340)	.20*** (326)	1.00					
IIS3	.02 (139)	-.14** (326)	.00 (326)	.03 (326)	.15** (315)	.23*** (320)	1.00				
IIS4	.14* (141)	-.12* (330)	-.03 (330)	.06 (330)	.18** (317)	.21*** (327)	.18** (311)	1.00 (330)			
IIS5	.05 (142)	-.20*** (328)	-.11* (328)	-.01 (328)	.27*** (318)	.13** (323)	.13* (309)	.22*** (315)	1.00		
Soc. Int	.17* (134)	-.18** (326)	-.20*** (326)	.11* (326)	.79*** (326)	.76*** (326)	.26*** (309)	.25*** (314)	.27*** (313)	1.00	
Ac. Int	.13 (134)	-.18** (311)	-.04 (311)	.07 (311)	.21*** (301)	.27*** (308)	.66*** (311)	.85*** (311)	.26*** (296)	.32*** (298)	1.00

Note. Numbers in parentheses represent the n for each correlation.
*p<.05, **p<.01, ***p<.001

Table 9, continued

RJI = Reflective Judgment Interview

NCQ= Noncognitive Questionnaire Scales

NCQ5--Availability of a Strong Support Person

NCQ5--Successful Leadership Experience

NCQ8--Knowledge Obtained in a Field

IIS= Institutional Integration Scales

IIS1--Peer Group Interactions

IIS2--Interactions with Faculty

IIS3--Faculty Concern for Student Development and Teaching

IIS4--Academic and Intellectual Development

IIS5--Institutional and Goal Commitments

SocInt--Social Integration (IIS1+IIS2)

AcInt--Academic Integration (IIS3+IIS4)

Table 10. Interrcorrelation Matrix between RJI, NCQ and IIS Scores with Other Variables

Variables	RJI	NCQ5	NCQ6	NCQ8	IIS1	IIS2	IIS3	IIS4	IIS5	SocInt	AcInt
ACTEng	-.04	-.12*	-.10	-.10	.13	.08	.28***	.12*	.05	.13*	.23***
	(112)	(254)	(254)	(254)	(243)	(250)	(238)	(243)	(239)	(239)	(228)
ACTMath	-.06	-.06	-.16**	-.08	.03	.06	.17**	.02	.14*	.06	.11*
	(112)	(254)	(254)	(254)	(243)	(250)	(238)	(243)	(239)	(239)	(228)
ACTSS	.08	-.03	-.16**	-.01	.11*	.03	.29***	.01	.05	.09	.16*
	(112)	(253)	(253)	(253)	(242)	(249)	(237)	(242)	(238)	(238)	(227)
ACTNS	.24**	.00	-.14*	-.11*	.02	.01	.10	.05	.05	.01	.10
	(112)	(253)	(253)	(253)	(242)	(249)	(237)	(242)	(238)	(238)	(227)
ACTComp	.07	-.06	-.19**	-.09	.08	.05	.25***	.06	.08	.08	.17**
	(112)	(253)	(253)	253)	(242)	(249)	(237)	(242)	(238)	(238)	(227)
GPA	.20**	-.16**	-.06	.08	.01	.05	.12*	.32***	.19***	.04	.32***
	(140)	(320)	(320)	(320)	(307)	(314)	(301)	(305)	(304)	(301)	(287)
HSGPA	-.20*	-.06	-.12*	.01	.06	.11*	.09	.15**	.22***	.10*	.18**
	(120)	(266)	(266)	(266)	(254)	(261)	(253)	(252)	(255)	(249)	(240)
HSRank%	-.14	-.05	-.04	.04	.11*	.13*	.10*	.14	.21***	.15*	.17*
	(122)	(278)	(278)	(278)	(268)	(273)	(263)	(267)	(267)	(263)	(253)
SES	-.01	-.13**	-.11*	-.03	.07	.02	-.04	-.04	-.07	.05	-.05
	(146)	(344)	(344)	(344)	(330)	(338)	(324)	(328)	(326)	(324)	(309)
Income	-.07	-.08	.06	-.04	.09	.03	.02	.02	-.04	.07	.03
	(59)	(150)	(150)	(150)	(143)	(145)	(144)	(141)	(141)	(138)	(136)

Note. Numbers in parentheses represent the n for each correlation.
*p<.05, **p<.01, ***p<.001

Table 10, continued

RJI =	Reflective Judgment Interview
NCQ=	Noncognitive Questionnaire Scales NCQ5--Availability of a Strong Support Person NCQ5--Successful Leadership Experience NCQ8--Knowledge Obtained in a Field
IIS=	Institutional Integration Scales IIS1--Peer Group Interactions IIS2--Interactions with Faculty IIS3--Faculty Concern for Student Development and Teaching IIS4--Academic and Intellectual Development IIS5--Institutional and Goal Commitments SocInt--Social Integration (IIS1+IIS2) AcInt--Academic Integration (IIS3+IIS4)
ACTEng=	ACT English subtest score
ACTMath=	ACT Math subtest score
ACTSS=	ACT Social Science subtest score
ACTNS=	ACT Natural Science subtest score
ACTComp=	ACT Composite score
GPA=	Grade Point Average
HSGPA=	High School Grade Point Average
HSRank%	High School Rank Percentile
SES	Socio-economic status (based on parents' educational levels and occupations)
Income	Family Income